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# East Europe Report

SCIENTIFIC AFFAIRS

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## EAST EUROPE REPORT SCIENTIFIC AFFAIRS

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PROGRESS IN SEISMOLOGICAL RESEARCH REVIEWED

Tirana ZERI I POPULLIT in Albanian 17 Apr 82 p 3

[Article by Eduard Sulstarova, director of the Seismological Center: "The Fields of Our Seismology"]

[Text] In the past five-year plan, the main task in the field of seismological research was the execution of studies on the regional seismology of the country. In this framework, about 2 years ago, the study of the "seismological zoning of the People's Socialist Republic of Albania," was completed and is being better and better implemented in our constructions, together with the seismological map of 1: 500 000. The study was based on abundant seismological and seismogeological material and has been drafted according to contemporary methods. On the other hand, many studies have been prepared; they are connected with the most thorough knowledge of earthquake characteristics of our country, with their distribution in space and in time, with their relationships with the geological-tectonic conditions and so forth.

In the past years, our center has properly represented itself in scientific activities outside the country, where our workers have successfully and competently communicated our studies, of which a great part now is well received and even published in scientific magazines in some European countries. With its publications, our center has relationships with more than 60 research and scientific institutions in the world.

There are now three main fields where this institution has concentrated its work: seismicity, which now is a consolidated field; seismological microzoning; and earthquake engineering.

In the research field of Albania's seismicity, our studies aim at extending the knowledge about seismological activities in our country in order to draw up a seismological map of 1: 200 000, to make the first steps toward forecasting earthquakes and toward forecasting their place, force and time (a short time forecast), and to make a contribution to the clarification of the construction of the crust of the earth in depth--an important problem for our country's geology, for tectonic construction and so forth.

While the dispersal in time and in space of expected seismological danger for the entire country (according to the main seismological zones) and for the

average engineering-geological conditions is being studied in the seismological zoning, seismological microzoning studies the dispersal of this danger on construction sites, whose dimensions are much smaller than in seismological zones. The studies carried out on the consequences of the big earthquakes in the world and in our country, (for example, the earthquake of 15 April 1979), have shown that the largest areas which were damaged or destroyed were generally situated in relatively small regions and, what is most important is that the great changes that resulted were observed in smaller distances. Now it is known that the effects of earthquakes on projects and structures depend on a complex of factors, such as the seismogenetic characteristics of regions, the physical-mechanical characteristics of the land and of its composition and construction, the characteristics of structures and of building materials, and so forth. In order to determine concretely the relationships between these factors, it is necessary that they be studied thoroughly and with the most suitable methods and techniques. This is the target of the studies of seismological microzoning and of earthquake engineering, the two new fields of this institution.

It is understandable that the studies of seismological microzoning cannot be carried out for every project. They are indispensable for the most important industrial projects, the big hydroelectric power stations, the high buildings, the big bridges, and other works with a special political and economic importance. The map of seismological zoning will be used for all other projects. The problem of the seismological microzoning of the industrial sites and residential centers is a complex one; and a number of institutions and enterprises in our country are engaged in solving it on schedule and with good quality. Thus it is intended to solve the problem of the study of the physical and mechanical characteristics of the lands and of their formation and geological construction by using the complex of methods of engineering geophysics. Nevertheless, the improvement of quality of geological-engineering studies, in addition to the introduction of the complex of geophysical methods, in a broader manner, is linked with the invigoration of the laboratory and field material base, with the training of cadres and so forth. Without complete studies in this field, studies which are necessary for the designing purposes of construction works, it is not possible properly to accomplish the study of the seismological microzoning of lands on which the building of the most important socioeconomic projects is foreseen.

In the field of earthquake engineering, a field which has just begun, research activity aims at studying the bearing effect of projects and of structural elements and of their joint action with the land during earthquake tremors. Seeing them under this aspect, studies in this field are very closely linked with those of seismological microzoning. At the present stage, cooperation is directed toward the revision of technical conditions of planning--a very important matter for the economy of our country, as a seismological land. To pave the way for these studies, it is necessary to develop gradually the accelerographic network, from which we will acquire indispensable data for studies in the field of engineering seismology (microzoning) and earthquake engineering.



The studies of seismological microzoning and those of earthquake engineering aim at providing designers with very completed data for seismological designing and at perfecting the technical and economic criteria of this design. We are convinced that, from these studies, it would be possible to design works which will resist possible earthquakes much better and will cost less to be built. The introduction of light structures in building is not being executed properly, and some difficulties in understanding and in organizing are not being overcome, although their development greatly reduces construction costs and increases resistance toward earthquakes.

In the urban studies, too, it is necessary for the entire study and design work to be better coordinated with the geological-engineering and seismological studies, as it has started in Vlore, Durrës, and Shkoder. The experience acquired from the areas which were affected by strong earthquakes, where the epicenters were, especially, in cities or nearby areas, has shown that considerable damages also occurred because of the lack of seismological conception during urban planning. In the active earthquake areas, it is essential, in regard to urban studies, to take into consideration seismicity in order to anticipate the necessary space between the projects so as to find the best height for the projects to be built for the purpose of preventing them from being damaged by the phenomena of resonance during seismological tremors. We consider that it is indispensable to stress these things, because the Institute of Designs and Studies No 1, and the urban offices attached to the executive committees of the district people's council are continually working to perfect the urban plans for their residential centers. We must work with the same concern in regard to the best cooperation possible between urbanists and seismologists, so that these studies will be completed in the best manner possible.

In regard to urban planning of villages, we think that we should make better use of the experience acquired during the elimination of the consequences of the earthquake of 15 April, 1979, in the new villages which were built in general on solid ground with an urban conception of the time. It is also worth mentioning that our designers must rely even more on the experience of our people, who have always been aware of the necessity to build on solid and resistant ground.

In addition to the study and designing aspect, in regard to the resistance of projects to earthquake tremors, of equal importance also are the strict execution of conditions and of technical rules and the use of suitable materials in construction. With the invigoration of the district urban offices by builders and geologists, we believe that the conditions have been created for raising the planning level of studies and for improving the monitoring of these constructions.

9150

CSO: 2102/8

USE OF NUCLEAR PHYSICS IN AGRICULTURE, INDUSTRY

Tirana YLLI in Albanian No 8, Aug 81 p 24

[Article by Servet Dahi: "Nuclear Physics in the Service of Production"]

[Text] The Institute of Nuclear Physics of the Academy of Sciences is the most skilled center in the country for assimilating nuclear methods and techniques and for putting them in the service of production. It cooperates with dozens and dozens of production enterprises, agricultural cooperatives, various research and health institutions and so forth, both coordinating their work and providing them with products of the scientific work and experience that has been gained; it supervises the training of their workers.

The institute carries on a wide scientific activity and, through its 29 scientific themes, has affected, to various extents, the majority of the fields of work of the production centers. This very wide and very varied subject matter is a result: first, of the many requirements of the development of nuclear methods; and, second, of the practically unlimited possibilities of nuclear methods and techniques for solving the most different problems of production and research.

The treatment of such a wide theme and its deep study have required and require, on the part of the institute's workers, a constant mobilization and persistent work. And, the workers, under the leadership of the basic party organization, with the teaching of the party and of Comrade Enver in their minds and hearts, have increased their efforts more and more to assimilate this new and difficult science, its powerful methods and fine technology.

It is known that the demands from the various branches of our economy, such as the electric, electronic, and chemical industries and other industries, for the most varied plastic materials, have been continually increased.

The achievements of chemistry in this field are, undoubtedly, numerous. However, methods of radiation have given a new impulse to the execution of such processes, as the synthesis of plastic materials and the modification of materials which now are known, such as polyethylene, polyvinyl chloride, rubber and so forth. Achievements in the field of polymers, such as the production of radiated polyethylene, radiative polymerization and a number of other processes, are of great theoretical and practical interest.

A thorough and interesting study has been carried out at the Institute of Nuclear Physics for modifying the characteristics of polyethylene. As it is known, polyethylene takes an important place among the polymers which are produced today. It is a good electric insulator. At room temperature, it is chemically inert toward a number of organic dissolvents and toward a number of bases and acids; it is elastic; it is not poisonous and so forth. Therefore, it is widely used as an insulator in conductors and cables, in various electric and electronic pieces of equipment and machines and in chemical apparatuses as a protection from friction and so forth.

However, polyethylene has some shortcomings which limit its utilization in a noticeable manner, such as a low mechanical resistance at high temperatures, low thermal resistance, a great dissolution in various organic solvents during their heating process, bursting and so forth.

After many tests and studies, it was observed, from the radiation of polyethylene with specified doses of accelerated electrons at the accelerator of the institute, that many characteristics of polyethylene were changing. Polyethylene through radiation can be considered as a new plastic material. Because of the creation of indirect relationships between the molecules and the formation of "giant" molecules, a polyethylene with a new structure, consequently, with new characteristics, was obtained. The thermal resistance is increased. The radiated polyethylene preserves well its characteristics and form up to the temperature of 150° centigrade; at this temperature, the ordinary polyethylene is completely dissolved. Chemical resistance increases. Radiated polyethylene dissolves very little in organic solvents and in their boiling temperature and has many new characteristics, such as dielectric resistance.

Radiated polyethylene acquires the wonderful characteristic known as the "memory effect." After a sheet of polyethylene goes through boiling water, for example, it extends up to 75 percent of its initial length. Let us envelop, for example, the head of a cable with this sheet of polyethylene and, later on, heat it up to about 120 centigrade. The sheet of polyethylene is enclosed up to its initial length, tightening the head of the cable in a perfect manner and ensuring that it is filled hermetically.

A number of electromotors with a tension of from 380 to 6,000 volts with a power of from 1 to 500 kilowatts and a number of connecting underground telephone cables are insulated with sheets of radiated polyethylene produced at the institute. These pieces of equipment, after their successful test, continue their normal activity. The insulation of the meters of the two high tension generators of 6 kilowatts with a power of 500 kilowatts and 2,500 kilowatts has also been successfully carried out. Radiated polyethylene, in these works, has replaced mica and epoxy resins which are imported materials. The technological process of the processing of pieces of equipment with this material is very simple.

The very good characteristics of radiated polyethylene have attracted the attention of many enterprises of the country. They demand other forms of radiated polyethylene; therefore, studies are being continued at the institute so as to produce polyethylene tubes with memory effect, insulated conductors with thermal resistance and so forth.



Another field, where our institute is making its contribution, is agriculture, to which a special attention is being given. A very large field in this direction is the use of radioactive trackers for the study of the utilization of the nutritive substances of the soil or of fertilizers by crops.

To utilize fertilizers produced by our industry in the most effective manner, for example, the superphosphate produced in Lac, the institute made a name for itself with radioactive phosphorus; and the "radioactive fertilizer" was used in vegetation and field experiments in order to have an idea about the coefficient of utilization of phosphorus in fertilizer by wheat and corn in accordance with the various schedules of fertilizing. Thus, for example, an experiment carried out at the Krutje agricultural cooperatives showed that the phosphorus in fertilizer, when it was applied at the beginning of the vegetation of corn, regardless of the manner of fertilizing, constituted only 2 percent of the phosphorus received by the crop. This means that, in this case, the effectiveness of the utilization of fertilizer is very low. The crop, actually does not use fertilizer at all and it takes almost all its nutrition from the soil. Under these conditions, there is no reason to use phosphate fertilizer.

Again, using radioactive phosphorus, the Institute of Nuclear Physics studied the activity of fertilizer phosphorus in soils of various types. Thus, for example, it was observed that in heavy argillaceous soils, phosphorus does not move at all; it stays where it is applied; while, in some sandy soils, it moves in a noticeable manner.

Another important work has been the study of the effects of radiation in the stimulation of seeds before sowing. Through a long research work, it was possible to find the best doses of radiation which lead to an increase in yields and in early growing and so forth.

And this is what the present facts show: with specified doses of radiation, the potato yields for 1977, 1978 and 1979 increased in a noticeable manner. In regard to tomatoes of the "monidor" type, produced in greenhouses, yields increased by 10 percent and the tomatoes were harvested earlier than the tomatoes which were not radiated. The yields of sugarbeets increased 10-17 percent and the sugar content also increased.

With these three examples, we showed some results achieved by the Institute of Nuclear Physics. They are concrete and satisfactory results. The institute, however, has even more comprehensive results. It has created its own physiognomy; now, it has a definite theme, has made good progress in the creation of a tradition in scientific work and, above all, has created a group of impassioned scientific cadres with high ideological and vocational training. In the past 2 years alone, almost one-third of the scientific cadres of the institute successfully defended their dissertations for the first level of post-university training.

Inspired by the directives of the Seventh Five-Year Plan, the workers of the institute continue their work with greater intensity in order to implement the great tasks entrusted to them by the party.

NEGLIGENCE IN PROSPECTING FOR VALUABLE ORES CITED

Tirana ZERI I POPULLIT in Albanian 8 May 82 p 3

[Article by Bashkim Lleshi, director of the Institute for Studies and Designs in Geology and Mines: "From Mountain Ranges With Prospect to Unexplored Mountain Ranges"]

[Excerpts] The Institute for Studies and Designs in Geology and Mines, in collaboration with all the geological and geophysical enterprises, has stipulated that all studies for prospecting for the main ores and new ores be based on a sound geological base set on a scale of 1:25,000. On this basis, according to prospecting studies carried out, the institute, in cooperation with the geological and geophysical enterprises, will cover all eastern and northern zones of our country with complex surveying. This will open up new opportunities for prospecting and discovering useful solid ores in unexplored zones which at present appear to be unproductive.

The transition from the known to the unknown was carried out in the study of the prospects and the prognosis for chrome in the Bulqize mountain range which serves as a model for studies in all the ultrabase ranges in Albania. In this range new chrome-rich strata were found and some of them appeared to be of good and very good quality. Nevertheless, knowledge about this area is still very "poor" since prospecting work in this range has just begun.

At the present time, the system of completing such studies and other works is established on a new geological basis, on the new geological map of the People's Socialist Republic of Albania which has a scale of 1:200,000.

The strengthening of the geophysics enterprise in Tirana, so that it will better respond to the needs of the geological service of the country, will increase considerably the effectiveness of geological workings and will result in the improvement of prospecting methods and the reduction of the volume of drilling and ore workings. The reduction of the volume of these operations will permit us to strike more exactly, "with the first shell," in other unexplored regions and mountain ranges.

Our country is full of valuable ores of all kinds. However, in prospecting activity, emphasis is sometimes placed on the most important ore and the other ores are not given the proper attention. For example, the Gjirokaster geological enterprise, which is chiefly concerned with phosphorites, does not give

the same attention to all the other ores which might be found in the area where it carries out its activity; the geological enterprises in Bulqize and Burrel, which are chiefly concerned with chrome ore, have no justification for ignoring the other ores, as they do. Not only the geological enterprise in Kukes should be engaged in prospecting for olivines. All possibilities exist for supplying the "Steel of the Party" metallurgical combine with olivines to be used as raw materials. The improvement of geological expeditions in new regions such as the Gramsh and Sherbenik alps will be valuable in this regard.

Up to the present, some solid ores have been somewhat ignored by the petroleum geological service and the signs of their appearance have not been properly evaluated. Cooperation and coordination of work is necessary for the good progress of geological prospecting work in these and other areas.

CSO: 2102/9

ROLE OF OFFICE FOR STANDARDIZATION, MEASUREMENT IN AIDING ECONOMY

Prague CESKOSLOVENSKA STANDARDIZACE in Czech No 2, 1982 pp 47-49

[Article by Eng Miroslav Vytrens, CSc, Office for Standardization and Measurement, Prague: "The Participation and Role of the Office for Standardization and Measurement Toward Improving the Planned Management System of the National Economy After 1980"]

[Text] The quality of Czechoslovak products has been a critical problem of the Czechoslovak economy for several years and one of the determining conditions for meeting the program of the 16th CPCZ Congress—maintaining and improving the standard of living attained by our population and developing its social security consistent with the expansion of the national economy. The conclusions of the 16th CPCZ Congress emphasized that improvement in the quality and technical standards of products must be given top priority as a condition warranting the expenditure of material resources and human labor.

The Office for Standardization and Measurement [UNM] has an important role in meeting these fundamental objectives of the national economy. Its operation is prescribed by laws on technical standards, measurement services and state testing. The Set of Measures attaches great importance to these technical activities as tools that, through efficient application, can greatly influence the structure of the national economy both by consistently improving product quality and by increasing efficiency of products and consumption.

In the area of technical standardization, the Set of Measures emphasizes that standard-forming activity should be intensively directed toward optimalization of the technical-economic parameters of raw materials and products and toward effecting savings in energy. Maximum efforts should be directed toward international unification of standards, especially in CEMA, which is necessary both for effecting orderly socialist-economic integration and also for the sake of international trade in general, on which the CSSR greatly depends.



In connection with the required goal-oriented program procedures for planning in connection with long-range prospects, it is necessary to apply this principle also to long-range planning for developing technical standards by working out long-range programs for developing the standard base, updating it systematically and forming the conditions for its utilization in the planning process. This calls for eliminating as far as possible the lag between the level of technical standards and technical progress, which still exists in certain cases.

The UNM proceeded conscientiously toward meeting all these requirements even before the Set of Measures had been adopted. A long-range outlook of technical standardization up to the year 1990 had been worked out in connection with the development of individual branches and sectors of the Czechoslovak economy in relation to state goal-oriented programs, the Long-Range Goal-Oriented Program of Cooperation under CEMA, agreements on cooperation and collaboration concluded under CEMA as well as the anticipated development of foreign trade with nonsocialist states. This study is being further elaborated with a time horizon up to the year 2000, with systematic refining it will serve for the preparation of intermediate plans in the area of technical standardization in future 5-year plans.

Standardization activity has a well-defined international character. The development of joint technical standards of CEMA countries is of critical importance. The foundations for this work were laid when the "Statute of CEMA Standards" was approved at the 28th CEMA Congress in 1974 and when the Convention on Application of CEMA Standards was adopted, with ratification by the CSSR the same year. Annual plans for the development of CEMA standards consist of some 2000 standardization subjects, the establishment of which should make a maximum contribution toward developing the socialist integration of the CEMA states. By the end of the first half of last year, 3,108 CEMA standards had been worked out and approved by CEMA authorities. Of these, 2,530 were adopted in the CSSR for use as CEMA standards. The conditions necessary for introducing additional standards are in preparation.

CSSR representatives actively participate in standardization work within the framework of world standardization organizations, the most important being the ISO (International Standards Organization), IEC (International Electrotechnical Commission), EHK/STAND (European Economic Commission's Conference of Governmental Representatives Responsible for Policy in the Field of Standardization), OIML (Organization for Legal Metrology) and several others. In view of the unusually extensive international activity of these standardization organizations and CSSR capabilities, Czechoslovak representatives participate selectively only in those bodies and commissions that have a preferential connection with the needs of the Czechoslovak economy.

The key condition for further development of the Czechoslovak national economy is consistent achievement of substantial savings in raw materials, other materials and energy, both in the production sphere and in consumption. With this in mind, the UNM proceeded toward a systematic checking and

reviewing of all valid Czechoslovak standards. Rigid criteria are applied here, especially with respect to energy and material demands of the products, overall indicators of their quality, reliability, useful life and high efficiency in use. Even though the focus of technical standardization is on material production, great attention and strict measures are applied to the development of standards of a general character, especially those that affect the environment, labor safety and the health protection of our citizens.

In providing measurement services the Set of Measures calls for more activity in production, particularly in key industrial sectors. This is self-evident, because it is practically impossible to envision improving the quality of products during production without systematically redefining and verifying the measured values of the physical quantities by a system of standard measures coordinated with international standard measures. Of course this directly influences both the standardization of the technological production process and the final quality of the product.

The exceptional importance of metrology, however, is apparent not only in the production process; its importance is evident in the measuring and balancing of materials and raw materials, in the consumption of energy of all kinds, since when handling large quantities inaccurate measurements can result in significant material and financial losses. A case in point is measuring the flow of natural gas in transit gaslines, measuring the flow of oil and petroleum products through oil pipelines and product pipelines, etc.

The level of measurement services contains certain deficiencies exhibited both in the management of national metrology and in securing production of the required standard measures as well as in measuring services provided by central bodies in individual branches and sectors. In the interests of greater improvement in national metrology, on 1 January 1981 the UNM proceeded toward a basic reorganizational move by consolidating the entire national metrology into a single unit under the Czechoslovak Metrological Institute in Bratislava. This should function as a research-production unit, working on metrological research projects and performing the practical checking of standard measures as well as securing their production, especially where it is not being provided elsewhere and is difficult to secure in the Czechoslovak industry because of technical demands and the nature of unit production. This concept is contingent upon capital construction by the Czechoslovak Metrological Institute.

The Set of Measures attaches great importance to national testing; this is being performed on the basis of Law No 30/1968 of SBIRKA. A system of 39 state testing stations is operating; 4 are directly subordinate to the UNM and the rest are incorporated within other central bodies and directed by the UNM. In all, these testing stations evaluate more than 30 percent of the volume of all Czechoslovak production expressed in terms of value.

The Set of Measures calls for increasing the scope of rated products by also involving departmental testing stations and raising the standards of procedures by emphasizing economic criteria, especially export efficiency. Compared with the 1981 plan, the proposal for the Seventh Five-Year Plan calls for a differentiated increase in the capacity of state testing stations by almost 8 percent in 1982, or up to 2.5 million Nh [?standard hours, ratings?]. However, increasing the volume of products rated does not depend solely on extensive development of national testing, the conditions for which are limited, but rather on increasing the efficiency of state testing stations and their management. In this connection the UNM is preparing certain organizational measures, the implementation of which will depend on decisions of the highest party and national bodies. "Main Directions of Economic and Social Development of the CSSR in 1981-85," which characterizes the development of individual branches and sectors, applies also to the material structure of state testing operations. In this connection the nomenclature of products being evaluated by state testing is defined and updated and also the nomenclature of products designated for rating in departmental testing stations, whose operation is in fact only starting up, are also defined in cooperation with appropriate central bodies.

The evaluation of products in state testing stations has consisted mostly of rating technical indicators and comparing them with the technical indicators of similar products of leading world producers. In this regard the performance of state testing stations meets required standards, even though the acquisition of conformable foreign models and technical documentation is often problematical. However, what is really problematical is determining and evaluating objective economic indicators of products, particularly from the point of view of export efficiency where commercial capabilities of foreign trade are also definitely involved. Certain proposals of economic indicators are being checked out in the practical operations of state testing stations; in the meantime their objectivity does not appear to be clear or realistic. However, these conditions are necessary for evaluating products by state testing stations if we recognize, on the one hand, the appreciable apprehension of producers of inferior products and the considerable markup when products are rated first quality.

The fundamental importance of objective product evaluation also stems from the fact that, beginning with the Seventh Five-Year Plan, a qualitative structure of production and overall volume of products rated as first quality is being planned for the state industrial plan of production and sales. Nonfulfillment of this indicator would indicate nonfulfillment of the state plan by production enterprises, with ensuing appropriate consequences.

Experience has shown that starting product evaluation even in the preproduction stage can effectively contribute toward obtaining better product quality. This gives the manufacturer the opportunity to eliminate any deficiencies in product quality even before it is put into production. The state testing stations have developed the capacity necessary for this. For the time being, the manufacturer is not obliged to submit his product

in its preproduction stage for evaluation by state testing stations. The importance of this procedure cannot, however, be disputed and so the amendment of UNM Decree No 32/68 of SBIRKA, which is in preparation, makes this procedure mandatory.

An important task assigned by the Set of Measures to the FMTIR [Federal Ministry for Technological and Investment Development], the UNM and central branch authorities, which proceeds from Resolution No 178/77 of the CSSR Government Presidium, is to complete a system of quality management and control in enterprises, VHJs [Economic Production Units] and departments. Within the framework of this task the "Comprehensive Systems of Managing Product Quality" will be introduced or is already in effect in enterprises. This should be superimposed by management systems on the VHJ and production department level and regionally on the state level.

To work on these complicated problems there are specific tasks of the state plan for economic research on which the scientific-technical base of UNM is working. Since broad application is expected in the comprehensive systems of standardization, metrology and state testing stations, the control role of the UNM is being reinforced substantially beyond legal provisions and standards in the areas noted by organizations of the national economy in the form of technical state supervision over standardization. For this purpose, beginning last year, the UNM organized and is gradually setting up regional UNM divisions in Prague, Brno and Bratislava.

The UNM workers realize that successful implementation of the Set of Measures in the Seventh Five-Year Plan will allow raising the efficiency of the Czechoslovak national economy and thereby also secure further improvements in the living standard of our citizens. To this end they, too, want to contribute with all their might.

8491

CSO: 2402/45



PROFITABLE COMPUTER PROGRAM EXPORTS URGED

Prague SVOBODNE SLOVO in Czech 15 May 82 p 3

[Article by Martin Denemark: "Goods of Which One Is Unaware"]

[Text] Computer technology is flooding the world. In Czechoslovakia the number of installed computers of all sizes is rapidly approaching the 3000. To some extent we have not yet become accustomed to computers and are constantly amazed by what these nice "cases" are able to accomplish. Computers truly are able to do many things, but they are entirely dependent on the "intelligence" imparted to them by man. This intelligence is the program that can be defined simply as sequence of orders or instructions that the computer executes.

Programs have deservedly become a significant trade item; incidentally, HOSPODARSKE NOVINY called attention to this fact in its No 7 issue of this year. In many countries there have been formed companies specializing in the writing and sale of separate computer programs. For example, in the independent catalogue "ISIS Software Report", in which various companies advertise, over 4000 programs are listed for West Germany, Austria and Switzerland alone. Sales of separate programs in the United Kingdom exceeded 150 million dollars last year. Moreover, much software is sold together with the hardware, and there are cases when the value of the software exceeds 50 percent of the cost of the entire installation.

Czechoslovakia still has huge reserves in this field. Although the Polytechna Foreign-Trade Enterprise has several tens of programs available for export (in this respect it is beginning to catch up with the number of programs offered by Robotron in the GDR), our export of programs is still in its infancy. But this is entirely understandable, because the situation in export conforms entirely to the state of domestic sales and lists of available programs. And these are essentially nonexistent.

The situation on our domestic "market" for computer programs is still rather peculiar. It is not possible to set the prices of computer programs simply and unambiguously, and business law lacks provisions according to which enterprises could proceed. If there is any exchange of computer programs at all, it is mostly "illegal" trade, often directly between programmers. Such trading (let us admit that in most cases it is my program in exchange for yours) is still the most simple solution for the time being, but it contains certain risks and does not help to raise the requirements. It is understandable, for example, that the writer of a program will not assume responsibility for its quality and accompanying documentation. Theoretically,

moreover, a programmer could appropriate the work of someone else, while the company would be paying him as if it were his own work.

Of course, the inflexible and imperfect exchange contributes to the problems in recordkeeping. The national organizations for the technical servicing of computers --i.e., Kancelarske Stroje (Business Machines) of Prague, and Datasystem of Bratislava--have a monopoly to some extent on the writing and particularly the adaptation of programs, but so far they lack the capacity to maintain suitable and exhaustive records. They now have on file not quite 300 programs, and they are forced to operate without the benefit of organizational and legal relationships. Therefore their active distribution is very limited and not generally available.

The unfavorable consequences of these problems are very extensive. Our roughly 15,000 programmers are solving at their work places programming tasks that are similar to, or entirely identical with, the tasks being solved by their colleagues. For example, a large number of programs have been written in our country for the computer processing of payrolls or fixed assets. Thus we are wasting, quite unnecessarily, productive and creative capacities. After all, some of our programmers are on the same professional level as their foreign colleagues, and we could export very advantageously their work, or at least the results of their work. Another result of this situation is that top officials at the enterprises are ill-informed. They often are unaware that if their enterprise would offer its programs to Polytechna, it could earn valuable foreign exchange (if the program can be exported, or if it can substitute import).

In recent months, however, work has begun to unfold in our country that aims to gradually alter this unfavorable situation. It is headed primarily by staff members of Polytechna PZO [Foreign-Trade Enterprise]. They are now negotiating with Robotron about issuing joint catalogues of programs, which would be distributed through the regular network of bookstores. General availability of the catalogues would encourage enterprises to publish the results of their work, and thereby to establish contact with Polytechna. Moreover, there would be general awareness of the programs as merchandise.

Simultaneously Polytechna is preparing, for example, comprehensive records of the programs used in health care and geology. Together with the Advanced School of Economics in Prague, it will collect all the programs available for Wang computers that are installed at many of our enterprises. Polytechna wants to offer these programs directly to the company or to foreign users of its computers. Cooperation is being expanded gradually also with the Federal Statistical Office, with which Polytechna is cataloguing certain other programs, according to various aspects. The Federal Ministry for Technical and Investment Development also is filling a gap, by compiling a list of the programs used in planning and design.

The purpose of the present efforts is not only to prepare export quotes, but also to map what Czechoslovakia has done so far in the area of programming. Records of high quality will help to curtail certain unnecessary imports, will eliminate the duplication of some programming effort, and will contribute toward expanding our export of separate programs. This will be of great importance primarily in export, because separately offered programs are more readily marketable (especially in the capitalist countries) than our computer hardware, which for the time being lags behind the top world level.

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## BRIEFS

RESEARCH IN ENZYMOLOGY--The national protein program is aimed at expanding the protein base in human and animal nutrition. Consequently greater attention is being paid to proteins including enzymes at such research centers as the Budapest Institute of Enzymology of the Szeged Biological Center. In response to question, Academician Bruno F. Straub who has been director of the Institute since 1971 said the following: "Initially, we are investigating isolated enzymes. Later research switched to study of protein relation within the living cell, enzyme interaction. At the same time, one group is successfully investigating plasmin enzymes which dissolve blood clots. We have evolved a new analytical method for determining the individual components of proteins. Through this, the nutritional value of fodder can be established rapidly. Hogs raised on fodder prepared with our patented procedure for treating soya gain optimal weight on much less food." More and more theoretical research institutes are earning a substantial part of their operating funds directly through undertaking practical work on a contractual basis. The institute of enzymology is no exception according to Straub. However, he feels it would be self deluding to consider this an unequivocally good practice." Basic research is the primary goal of an academic research institute. There would be no future without it. Of course, basic research cannot be planned "without reference to social need. Therefore we now wish to contribute to the scientific bases of agriculture." [Budapest MAGYAR HIRLAP in Hungarian 21 May 82 p 5]

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